

B2  
conf'd

18. (Amended) The method of claim 17 wherein said radiation is selected from the group consisting of a lethal dose of ionizing radiation, a sub-lethal dose of ionizing radiation and a chronic low-dose of ionizing radiation.

---

3. Please add the following new claim:

---

File 126  
B3 29

26. (New) A method of treatment or prophylactic treatment of the lethal effects of ionizing radiation throughout the entire body of a mammal exposed to radiation, said method comprising administering to said mammal a therapeutically effective amount of an isoflavone.

---

### REMARKS

At the outset, Applicant would like to express her appreciation for the courtesies extended in the interview conducted in this case on March 21, 2003. Claims 1-9 and 17-25 remain pending, Claims 10-16 and 26-28 drawn to a non-elected invention, have been canceled without prejudice. Claims 1-2 and 17-18 have been amended.

In the Office Action of December 12, 2002 the Examiner rejected Claims 1-9 under 35 U.S.C. §112, first paragraph, arguing that the specification while being enabling for methods of treating the effects of radiation by administering to a mammal isoflavone, did not reasonably provide enablement for methods of preventing the effects of radiation in a mammal. This issue was discussed in the March 21, 2003 interview with the Examiner. In that interview, it was agreed that if the recitation of the term "preventing" in the claims as initially filed was changed to read "prophylactic treatment", that this rejection would be overcome. Independent Claim 1 has been so amended, and as a result Claims 2-9 dependent thereon have also been likewise amended. Applicant therefore submits that this rejection has been overcome by the agreed upon amendment to the language of Claim 1.

The Examiner also rejected Claims 1-9, 20 under 35 U.S.C. §112, second paragraph as being indefinite for failing to point out and distinctly claim the subject matter which Applicant regards as the invention. In this rejection the Examiner contended that the recitation of “methods of preventing the effects of radiation” was ambiguous and not clear as to what the scope of the term is. The claims has been amended to further modify this phrase. Applicant accordingly submits that any indefiniteness that may have existed in the original claim has been overcome as a result of this amendment.

The Examiner further alleged that the recitation of “isoflavone derivatives” in Claims 4 and 20, render the scope of these claims indefinite because he claimed it was not clear which derivatives Applicant was referring to. Applicant respectfully traverses this rejection. Applicant states that the term “isoflavone derivatives” is sufficiently defined in the specification and the claims in questions and also it is well understood as a term of art to those of ordinary skill. In support thereof, Applicant directs the Examiner to page 6 of the application wherein the general formula of isoflavone compounds, particularly useful in the invention, is stated. Thereafter, the application states “the isoflavone compounds can be derived from any suitable source such as soy, legumes, clover and the like using any of the techniques well known to one of ordinary skill in the art”. In addition, the examples 3 and 4 on page 13 of the application provide further definition for the use of this term.

Applicant further submits that use of the term “isoflavone derivative” is definite and is a well understood term in this art. In support thereof, a copy of the results from an internet search for this term are included herewith. As can be seen from these results, the term “isoflavone derivative” is definite and of known meaning to those skilled in the art. Reconsideration of this rejection is therefore requested.

The Examiner also substantively rejected Claims 1-9 and 17-25 as being anticipated separately by both the DeJuan Jr. and Wei patent references. The Examiner also rejected Claims 1-5, 7-9, 17-21 and 23-25 as being anticipated by the Lanzendorfer U.S. patent reference. As discussed in the interview, these references do not anticipate the claims as amended and are directed to fundamentally different subject matter and applications than the present invention. To begin with, the present invention is directed to preventing the harmful or lethal effects of ionizing radiation throughout the entire body of a mammal. As such, the present invention relates to radioprotection, which has the effect of protecting the entire body from death or serious injury caused by the harmful effects of ionizing radiation.

In stark contrast, the Wei, Lanzendorfer and DeJuan references all are concerned only with exposure to non-ionizing UV radiation. The Wei reference contains a typographical error, stating that UV rays are recognized as ionizing radiation (see Col. 1, lines 54-60). This statement is simply wrong and not supported by scientific fact. All of these references therefore are concerned with exposure of a portion of the body to non-ionizing UV light and not ionizing radiation as is the present invention.

The second fundamental difference in the cited references is that their goal is chemoprevention and not radioprotection, the goal of the present invention. Chemoprevention is an approach wherein certain drugs, or combinations of drugs are being used to prevent the occurrence of different localized diseases (e.g. diabetes, cataracts, cancers). In the three cited patents the goal is to reduce the risk of skin damage, a local condition (Wei/Lanzendorfer) or reducing the risk of a local disease such as cataract formation (DeJuan Jr.) as a result of exposure to non-ionizing UV light. These patents relate to the protection of light sensitive and normal skin or the eyes to UV rays from the exposure to the sun. They are not directed to the protection

of the entire body of a mammal from serious damage, harmful effects or death caused by exposure to doses of ionizing radiation, let alone lethal doses of such radiation. The focus of the cited references is therefore to decrease or inhibit at a localized condition and are not directed to the prevention of harmful effects throughout the entire body of a mammal exposed thereto or increasing survival of a mammal exposed thereto, as is the present invention.

Applicant submits that the claims as modified by this amendment now specifically contain the very important differences regarding radioprotection and ionizing radiation discussed above. As such, Applicant respectfully submits that they define patentable subject matter over the cited references whether taken alone or in combination.

The Examiner also rejected Claims 1-9 and 17-24 as being unpatentable over Wei et al (PSEBM 1995, Vol. 208, 124, 1995) in view of the previously described DeJuan Jr. U.S. patent. Applicant submits that the claims as amended define patentable subject matter over the Wei/DeJuan combination for reasons similar to those stated above with respect to the three cited patent references. The Wei paper cites a prior paper by Stevenson. The Stevenson paper teaches only that in a cell culture experiment ionizing radiation stimulates mitogen-activated protein (MAP) kinases which enables this class of enzymes to induce genes which promote the growth of the tumor cells. Stevenson makes no mention of isoflavones. The "speculation" in Wei is only that soy and isoflavones may inhibit MAP-kinase activity, therefore genistein might be a potential agent for use as a chemopreventive agent as a drug to prevent the occurrence of localized cancers from different causes, in his example, by ionizing radiation. Similar to the patent references previously discussed, Wei's teaching is only a speculation that there may be some potential benefit to use genistein as a chemopreventive agent for lessening localized conditions and not use as a radioprotective agent throughout the entire body of a mammal or

preventing serious harm or death as a result of exposure of the entire animal to harmful ionizing radiation.

For the foregoing reasons it is respectfully submitted that these references, taken alone or in combination, do not teach or suggest the invention in the amended claims in this application. Reconsideration and allowance is therefore respectfully requested of all claims.

If the Examiner has any questions regarding this amendment, he is invited to contact Applicant's attorney at the telephone number listed below.

Date 5/12/03

Respectfully submitted,



Thomas P. Liniak

Attorney for Applicant

Reg. No. 33,415

Liniak, Berenato & White  
6550 Rock Spring Drive, Suite #240  
Bethesda, Maryland 20817  
(301) 896-0600

## APPENDIX A- MARKED UP VERSION

1. A method of treatment [treating] or prophylactic treatment of [preventing] the harmful effects of ionizing radiation throughout the entire body of [in] a mammal exposed to radiation, said method comprising administering to said mammal a therapeutically effective amount of an isoflavone.

2. A method of claim 1 wherein said radiation is selected from the group consisting of a [n acute] lethal dose of ionizing radiation, a [an acute] sub-lethal dose of ionizing radiation and a chronic low-dose of ionizing radiation, [an acute lethal dose of non-ionizing radiation, an acute sub-lethal dose of non-ionizing radiation, and a chronic low-dose of non-ionizing radiation.]

17. A method of protecting throughout the entire body of personnel in need thereof exposed to ionizing radiation from radioactive substances, said method comprising administering to said personnel a therapeutically effective amount of an isoflavone.

18. The method of claim 17 wherein said radiation is selected from a group consisting of a [an acute] lethal dose of ionizing radiation, a [an acute] sub-lethal dose of ionizing radiation, and a chronic low-dose of ionizing radiation, [an acute lethal dose of non-ionizing radiation, an acute sub-lethal dose of non-ionizing radiation, and a chronic low-dose of non-ionizing radiation.]